

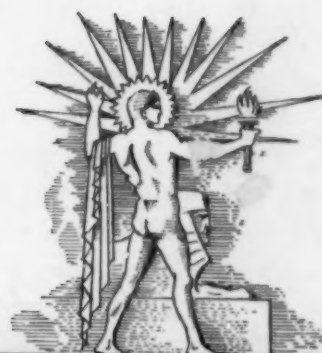
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APR - 3 1933

SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE •



APRIL 1, 1933

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DO YOU KNOW?

An ostrich eggshell holds about three pints.

Scholars in thirteen countries are cooperating in making a dictionary of medieval Latin.

About 500 people are killed by lightning each year in the United States and about 1,300 are injured.

Jericho, around which Joshua's army marched, was destroyed by a fire, is the finding of archaeologists.

Man is the only sufferer from anemia, under natural conditions, but research workers have induced anemia in dogs.

Chinese houses are arranged very much like the houses of ancient Rome, says Dr. Berthold Laufer, of the Field Museum.

An anthropologist points out that, of all the nations of Asia, only the Chinese eat sitting round a table, as the western world does.

At least 50,000 research papers are published annually on biological problems.

A German jurist suggests that police might find it useful to keep a set of "fingerprints" of all types of automobile tire tracks.

Crushable capsules of chloroform for use in childbirth to alleviate pain are being tried extensively in England.

The coldest place in the world is probably on top of Mount Nilsen in the Antarctic continent, is the theory of one meteorologist.

Contrary to popular tradition, Indians never intentionally scalped a living warrior, says Dr. Melvin Gilmore, anthropologist of the University of Michigan.

The economic depression has done one helpful thing for patients in mental hospitals—it has brought a number of graduate nurses into these hospitals despite low salaries offered there.

WITH THE SCIENCES THIS WEEK

ARCHAEOLOGY

Were ancient synagogues decorated? p. 196.

ASTRONOMY

How can you tell time from the "Dipper"? p. 198.

In what part of the heavens is the new star? p. 200.

What is the color of the light emitted by solar prominences? p. 204. *The Two Solar Families*—Thomas C. Chamberlin—Univ. of Chicago, 1928, \$2.50.

AVIATION

How does wool aid airplane designers? p. 201.

BIOPHYSICS

Why should farmers be concerned about *Penicillium javanicum*? p. 195.

CHEMISTRY

Can chemistry be used to deceive? p. 207. 100,000,000 Guinea Pigs—Arthur Kallet and F. J. Schlink—Vanguard, 1933, \$2.

What causes fabrics to fade when washed? p. 196.

What poisons do burning fabrics give off? p. 201.

What was the gold of alchemy? p. 200.

Where does the polish come from for the new self-polishing leather? p. 201. *The Chemistry of Leather Manufacture*—John A. Wilson—Chemical Cat. Co., 2 volumes, 1928-1929, \$10 per volume.

With what automobile fuel is it suggested that sugar be used? p. 202.

Who discovered oxygen? p. 197. *The Story of Chemistry*—Floyd L. Darrow—Bobbs-Merrill, 1927, \$4.

ELECTRICITY-BIOGRAPHY

Which of the "big four" electrical pioneers in America is living today? p. 195.

GEOLOGY

How might the ocean have caused the Carolina "Bays"? p. 202.

MEDICINE

How was it determined that calcium fails to stop cancer? p. 195.

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Why is it easy for birds to make a living in the Far North during summer? p. 206.

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PHYSICS

Where does the Van de Graaff generator get its power? p. 197.

PHYSIOLOGY

During what month of the year is the thyroid gland largest? p. 200.

How does ultraviolet light kill living cells? p. 201.

PSYCHOLOGY

Why is a color blind engraver prized? p. 200.

ZOOLOGY

What state contains most pronghorn? p. 201.

ZYMOMOLOGY

What people are thought to have invented beer? p. 206.

These curiosity-arousing questions show at a glance the wide field of scientific activity from which this week's news comes. Book references in italic type are not sources of information of the article, but are references for further reading. Books cited can be supplied by Book Dept., Science News Letter, at publishers' prices, prepaid in U. S.

BIOPHYSICS

Mold Turns Glucose Into Fat; May Rob Pigs of Their Job

FARMERS of the far future may keep pens of *Penicillium* instead of pens of pigs. For experimenters of the U. S. Bureau of Chemistry and Soils have found a species of mold, known botanically as *Penicillium javanicum*, that beats the hogs all hollow at the job of turning carbohydrates into fat. At the spring meeting of the American Chemical Society in Washington, D. C., G. E. Ward and L. B. Lockwood told of their researches on this and other fat-making molds.

They found several species of *Penicillium* that contained a good deal of fat when well fed on glucose, but the one called *javanicum* was the champion of the lot. Its matted mass of white threads, when dried, contained from 20 to 43 per cent. of fat, depending on culture conditions. It takes only twelve days for the mold to produce the maximum quantity of fat out of the glucose solution.

When they extracted the fatty material it came out as a reddish-orange

oil, with a nut-like odor. A preliminary chemical examination showed it to be built up of the same constituents as many of the fats and oils that are now familiar articles of commerce. The new "mold-oil" is still in the experimental stage, and no definite commercial use for it has been suggested, but there is no doubt that industrial uses may be found for it if large-scale production makes it cheap enough.

Several of Messrs. Ward and Lockwood's colleagues described other recent progress in the taming of the aspergilli and the penicillia. Two tasks at which molds have proved themselves efficient workers have been the production from glucose solutions of citric and gluconic acids. The former is the familiar acid of lemons; the latter is a rarer acid, of possible use in medicine and industry, which thanks to the work of the government researchers now costs dimes a pound where it used to cost dollars.

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MEDICINE

Calcium Fails to Stop Cancer; Pepsin Index to Ulcer State

CALCIUM, claimed by some investigators to have a checking effect on cancer, failed in this respect in a large number of experiments on mice performed by Dr. M. J. Shear of the U. S. Public Health Service. Dr. Shear reported his work before the spring meeting of the American Chemical Society in Washington, D. C.

He transplanted cultured cancers of two types onto the bodies of some 1200 mice, and administered three different chemical salts of calcium either in the drinking water, in the food or by injection into the body. But the results were all negative.

"Treatment produced no reduction in the number of takes," Dr. Shear said. "Slightly smaller tumors were some-

times obtained in the treated mice, but a definite, regular reduction in the size or in the rate of growth of the tumors was not obtained."

The amount of pepsin in the stomach juice of patients suffering from stomach ulcer may give physicians a good index as to the progress and outcome of the disease, it appears from a report by Drs. Arnold E. Osterberg and Francis R. Vanzant of the Mayo Clinic. They studied the pepsin concentration in the stomach juice of some 400 patients after an Ewald type of test meal. They found a correlation between the pepsin concentration and the severity of symptoms which indicated that the pepsin concentration is a valuable prognostic sign.

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INDUSTRIAL REVOLUTIONIST, 80

ELECTRICITY-BIOGRAPHY

Millions of Birthday Lights For Dr. Elihu Thomson

NOT MANY REMAKERS of the world see their handiwork stir a civilization and infuse it with new comforts and new ideas.

Elihu Thomson is one of the industrial revolutionists of yesterday and today. Hale and hearty at four score years he was given a birthday party March 29 at Massachusetts Institute of Technology. The lights on his birthday cake are not merely 80, they are 80 times millions, electric lights, flashes from electric trolleys, flares from welding, throughout the world.

For Elihu Thomson, like Edison, is an electrical pioneer. Both present and past tenses must be used in describing his achievements, for at Lynn, Mass., Elihu Thomson still bears the torch of research onward in the General Electric Company's Thomson Research Laboratory that was built around him.

He was one of the original "big four" in pioneer electricity in America, the others being Thomas A. Edison, Charles F. Brush and James J. Wood, all of whom have died.

He successfully started an electric-light system, 1878-82, using arc lights.

He invented the first three-phase electric dynamo, a type of design now in everyday use.

He was the first man to use transformers on electric circuits in a modern manner.

He discovered the secret of electric resistance welding. (Turn Page)

He made the first practical electric meter for measuring watts, the forerunner of some 30,000,000 meters now installed in homes, factories, and stores.

Fifteen major medals in science and engineering have expressed the regard of his colleagues in scientific research and engineering. He was the first wearer of the famed Edison medal of the American Institute of Electrical Engineers and he is the only person to have been awarded the three high British science awards, the Hughes, Kelvin and Faraday medals. The John Fritz medal is another of Elihu Thomson's honors. He is, of course, a member of the National Academy of Sciences and he is a foreign member of the Royal Institution of Great Britain.

As a youth in Philadelphia his playtime was spent in mechanical and electrical experiments. He made tops with a foot lathe, constructed a frictional electric machine that knocked his father off his feet, ground lenses for an intricate microscope, built a pipe organ, and followed photography as a hobby.

Interested in astronomy for many years, he has his own observatory and a small telescope which he made himself. Nearly 35 years ago he suggested the use of fused quartz for telescope mirrors and the climax of a long career may be the construction under his supervision of a fused quartz 200-inch-diameter mirror for the giant telescope proposed for California.

Science News Letter, April 1, 1933

CHEMISTRY

Dyes Fading in Light Become New Compounds

COLORED fabrics that fade on exposure to light are not fading in the same way that they do when their colors are "washed out" in the laundry. The latter process is merely a reversal of dyeing: the dyestuff becomes "unstuck" and diffuses out into the water.

Sun-faded fabrics have their dyestuffs actually changed over into other substances, which may have colors of their own. This accounts for the fact that a sun-faded fabric may not merely be paler than it was when new, but may have a quite different hue.

These facts about sun-fading were brought out in a discussion before the meeting of the American Chemical Society, by William D. Appel of the U. S. Bureau of Standards, and William C. Smith, of the Lowell Textile Institute.

Science News Letter, April 1, 1933

ARCHAEOLOGY

Oldest Old Testament Scenes Unearthed on Euphrates

Magnificent Frescoes Surprise Scholars by Revealing That Christian Artists Borrowed From Jewish Art

ARCHAEOLOGISTS digging into the ruins of Dura-Europos on the Euphrates have made a discovery of sensational importance. They have found a Jewish synagogue built in 244 A.D. and adorned with paintings from the Old Testament. The pictures show Moses and the Tablets of the Law, Pharaoh pursuing the Israelites into the Red Sea, and other familiar Bible scenes. With the art of the Catacombs, these are the oldest pictures of Old Testament scenes ever uncovered.

News of the discovery has been received at Yale University from Prof. Clark Hopkins who is directing excavations at Dura. The site is being excavated jointly by Yale and the French Academy.

"I think that few excavators in this century have had the honor and privilege of reporting more astounding and magnificent discoveries than those made this last month at Dura," Prof. Hopkins' reports says.

Describing the excavation of the synagogue, he explains: "We have dared so far to dig only two and a half meters down, but as far as we have dug we have found the walls completely covered with a most magnificent series of frescoes. Eleven scenes are complete, some six others we have in part without counting the frescoes of the front and side walls."

Commenting on the significance of the Bible paintings, Prof. M. I. Rostovtzeff of Yale said the frescoes reveal that Christian art borrowed from Jewish pictorial art in style, composition, and subject matter. Few scholars had even suspected that this might be the case. It had been a common belief among some students that Jewish religion forbade decorating religious buildings with paintings, though recent discoveries have undermined this theory.

Prof. Rostovtzeff said: "This sensational discovery at Dura is of great importance for the study of the Bible, the history of Judaism in the days following the destruction of the Temple, and,

first and foremost, for the history of the early development of Christian art."

The archaeologists at Dura have built a roof over the remains of the synagogue to protect it from sun and rain. Photographs and colored drawings of the frescoes have been made. When all the preliminary work is completed, the murals will be removed from the walls and transported to a public museum for exhibition.

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PSYCHIATRY-EDUCATION

More Children Headed for Asylums Than for College

AT the present rate, more public school children will go to insane hospitals than will go to college, declared Prof. C. E. Turner of the department of biology and public health, Massachusetts Institute of Technology, in a report to the American Physical Education Association.

Pleading that the schools not reduce too drastically their health and physical education budget, Prof. Turner said:

"One would not be so absurd as to say that physical education is a specific preventive against insanity, but it is not far-fetched to say that teaching our people to play is one of the few important agencies through which we can combat that increasing pressure upon mental and emotional life.

"Our people need play and relaxation more than ever before," he continued. "In the hospitals of the United States there are more patients suffering from mental disease than from all other diseases combined.

"The excitement and pressure of modern life has increased together with the number of facts children must learn and the number of adjustments they must make. Every social indication points to the need of physical and recreational activity under wise leadership—a physical activity program which will develop enjoyment of exercise,

skill, and the proper mechanical use of the body."

Commenting that although the health program is one of the latest to be added to school activities, it should be one of the last to be cut, he pointed out that this program came with a fundamental change in living conditions.

"If we should abandon our health program, our city and consolidated schools would find themselves presented with an epidemic of communicable disease at the beginning of each new term as did the city schools prior to 1890."

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CHEMISTRY

Tellurium Added To Lead Protects Against Acid

SMALL AMOUNTS of tellurium added to lead increase remarkably the resistance of the metal to concentrated sulphuric acid, W. Singleton and Brinley Jones of the Associated Lead Manufacturers' Research Laboratories have reported to the Institute of Metals at London, England. The physical properties of the lead are also profoundly affected. Rolled sheet of the tellurium-lead alloy with a wide range of properties can be produced. Tellurium additions also affect similarly various lead alloys.

Science News Letter, April 1, 1933

PHYSICS

Cat's Fur Electricity Ready To Yield Greatest Voltage

Huge Static Machine Will Soon Emit 10,000,000-Volt Discharges With Power of Town Generating Station

TEN MILLION volts will soon be available to a group of Massachusetts Institute of Technology physicists. In an airship hangar on Colonel E. H. R. Green's estate in Massachusetts, the largest building they could borrow for their experiments, a gigantic electrical machine is being groomed for its test run. It consists of two columns surmounted by fifteen-foot hollow aluminum spheres. Men can climb into these hollow metal balls, and the interiors of which will serve as laboratories where the effects of high voltage electricity upon matter can be observed.

The giant electrical machine will provide the world's highest potentials of electricity under human control. Lightning has higher voltage but man cannot effectively harness the lightning.

One surprising thing about this ten million volt generator is that it needs no electrical input. It is its own power house. No large transformers are

needed. One of the oldest methods of generating electricity is used in this newest high voltage machine. Benjamin Franklin experimented with static machines and that other great American pioneer in physics, Joseph Henry, used frictional electricity generators to shock students holding hands in a circle.

Stroke a cat or comb your hair on a dry day and see the sparks fly. This method of generating static electricity is essentially the same as that in the ten million volt static machine about to be tested in New England. Static electricity antedates the electro-magnetic method that is used in the generation of practically all of the electric power today. The Greeks knew that by rubbing a piece of amber with a cloth an electric charge could be generated. With the practical application of the discoveries of Faraday and Henry, that motion in a magnetic field can generate a current, with the development of the vast electrical industry based upon these principles, static electricity did not have the opportunity of becoming practically useful but remained within the laboratory in the bags of scientific tricks of physics professors.

A modest young man, just thirty-two, is responsible for the application of the principles of static electricity in the development of the electrical machine which will soon give science useful potentials of many millions of volts. Dr. R. J. Van de Graaff was a Rhodes Scholar in Oxford when it first occurred to him to use static electricity to obtain high voltage. While in England he did not have the opportunity to make the necessary experiment but after leaving Oxford he went to Princeton University as a National Research Council fellow. There with the cooperation of Dr. Karl T. Compton, then professor of physics at Princeton and now president of the Massachusetts Institute of Technology, Dr. Van de Graaff made the first Van de Graaff generator. It cost less than a hundred dollars and it exceeded, in volt- (Turn to Page 204)



WEAPONS OF A PIONEER

The two hundredth birthday of Dr. Joseph Priestley, pioneer of chemistry in England and later in America, discoverer of oxygen, philosopher, philanthropist and friend of Washington, Jefferson, Franklin and Adams, was celebrated in connection with the meeting of the American Chemical Society in Washington, D. C., March 27 to 31. A feature of the celebration was the display of many pieces of his scientific apparatus, surviving in spite of the inevitable dispersals and breakages of a century and a half. The photograph reproduced here was taken at an earlier celebration: the centenary of his discovery of oxygen, held in 1874, at Priestley's old home in Northumberland, Pa.

ASTRONOMY

April Evening Skies

Two Planets and Ten Bright Stars Adorn Sky; Mars Apparently to Change Direction and Move Eastward

By JAMES STOKLEY

WITH THE COMING of April the springtime constellations, which during the last few months have been rising in the eastern evening sky, are in a position high overhead. Low in the southwest still appears Sirius, the dog star, marking Canis Major, and almost directly west is the belt and upper star—Betelgeuse—of Orion, all that now remains visible of that conspicuous winter constellation. Taurus is a little farther north, and is marked by Aldebaran; above it, and just to the right, is Auriga, with Capella as its brightest star.

But these constellations will soon disappear from the evening sky until next winter, so let us turn to the bodies that are now overhead in all their glory. High in the south is Leo, the lion, which can always be identified by the "Sickle." This implement now hangs with the curved blade pointing to the southwestern horizon. The handle hangs downward, and at its end is a first magnitude star, Regulus.

Poor Resemblance

The sickle is supposed to represent the lion's forefeet and head, but don't think your eyesight is failing if you cannot see the resemblance. No one else can, either! The ancients who gave the constellations their familiar names must have had considerably more active imaginations than we. But, in any event, the hind quarters of the lion are represented by a triangle of stars to the west of the sickle. The westernmost star in the triangle is Denebola, otherwise known as beta Leonis, because it is the second brightest star in the constellation. It is not of the first magnitude, but of the second.

Just at present Leo is enriched by the presence of an even more brilliant body than either of these stars. To the west of Regulus is an object shining with a steady light that readily distinguishes it from the stars. This is the planet Jupiter, largest member of the solar system of bodies, like the earth, revolving

around the sun, which is a star just like the far more distant ones that dot the night sky. Jupiter's mean diameter is 86,728 miles, nearly eleven times that of the earth, but just about a tenth the sun's.

Leo's next door neighbor, towards the southeast, is the constellation of Virgo, the virgin, marked by the bright star Spica. Like Leo, Virgo is also the hostess of a planet, which is Mars, famous for its reddish color. Though Mars is appreciably fainter than Jupiter, and is decreasing slowly in brilliance, it is brighter than any star in the vicinity; so the two planets form prominent additions to the evening sky.

All Are Moving

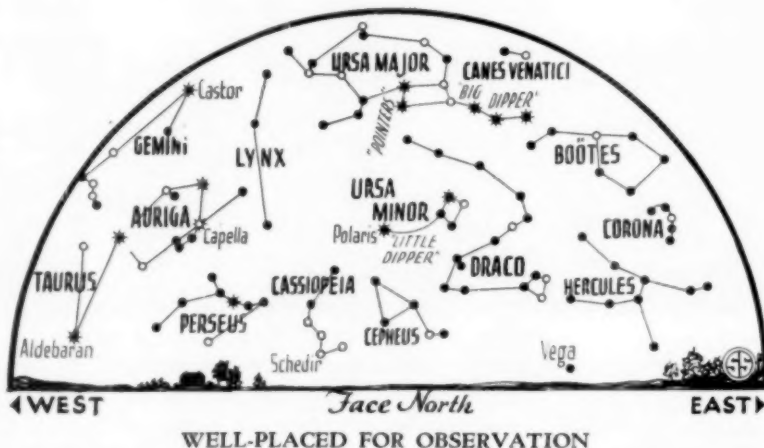
The stars and the planets are all in motion. The latter are revolving around the sun at the same time that the sun itself is moving through space, so their actual motion, with respect to the distant stars, is a helical one like the turns of a corkscrew or the miscalled "spiral" staircase. But the stars are at such vastly greater distances than the planets that their motions are, in most cases, not apparent to the naked eye in the course of a life time. For centuries the constellation figures remain unchanged.

The planets, because of their proximity, are continually moving among the stars, and if you watch the sky from night to night, taking notice of the relation of one of the planets to the nearby stars, you can soon see the motion. With the more distant ones, like Jupiter and Saturn, it might take several weeks before the motion could be detected without instrumental aid, but that is a short time compared to the time needed to see the movements of the stars—what is called their "proper motions."

Planets Follow Sun

Ordinarily the planets move eastward through the sky, as does the sun in its annual motion which takes it completely around in a year. But if you have been watching Mars of late, you would have found that it is going westward. During the early days of April it will be seen to be moving much more slowly than it has been, and on Thursday, the thirteenth, it will stand still for a short time. After that, if your observations were to continue, you would find that the planet is moving eastward. Then its motion would be said to be "direct," at present it is "retrograde."

The reason for this change in the direction of a planet's motion is that we are observing it from a moving platform—the earth. Possibly you have some time had the experience of being on a moving railroad train and passing a slower moving train. You may have



WELL-PLACED FOR OBSERVATION

Though it contains no first magnitude stars, the Big Dipper is probably our best known constellation. Its present position in the sky, high above the horizon, makes it easily observed, even through the glare of city lights.

thought that the latter was going backwards until by looking down at its wheels you could tell that it, too, was travelling along at a pretty good clip. The reason for this is that your own motion was not immediately apparent. When compared to you, the other train seemed moving backwards, though it was not when compared to the ground. Exactly the same thing is true of the earth and Mars. Because the earth's orbit is smaller than Mars,' we are moving more rapidly, and we regularly pass that body. Since the twenty-second of January we have been overtaking him, and as we have watched him from our smoothly running celestial train, he seemed to be creeping backwards. On the thirteenth of the month, we have passed around the curve, and are starting back to move directly away from him, and for the same reason his light is now decreasing. As we move on around to the other side of the sun from Mars, he will continue to move eastward, until we again catch up to him.

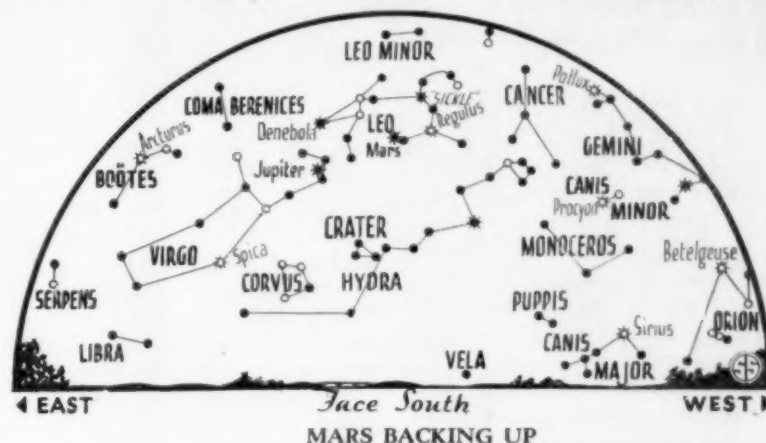
Several first magnitude stars in addition to those already mentioned are now visible in the evening. Directly west, about half away from the horizon to the zenith at ten o'clock at the beginning of the month, or nine o'clock on the fifteenth, is the constellation of Gemini, the twins. They are Castor and Pollux, but only Pollux is of the first magnitude. His brother is a little fainter. They are side by side, and Pollux is to the south or to the left. Another first magnitude star can be located if you follow a line from the twins to Sirius, low in the southwest. A little less than half way is the lesser dog, Canis Minor, with Procyon to mark it.

The other first magnitude stars are in the eastern sky. To the left of Virgo is Bootes, in which we find brilliant Arcturus. Low in the northeast, where it will gradually mount higher and higher night after night, is Vega, marking the first appearance this spring of Lyra.

Best Known

There is one constellation that is now particularly well placed for observation, and is probably the best known of all, though, curiously enough, it contains no first magnitude stars. This is the Great Bear, Ursa Major, of which the Big Dipper is the most familiar part. The dipper is now in the northern sky, almost overhead. The handle points to the eastern horizon; at the opposite side of the bowl are the two "pointers." If you follow an imaginary line

SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS



This is apparently what the neighboring planet has been doing since January 22. But on April 13 Mars will resume direct motion.

from these, you will come to the pole star, Polaris, which is almost directly above the north pole of the earth.

The "Big Dipper" is an American designation for these seven stars. In England they are called either "the Plough," or "Charles' Wain." The latter is cognate with the modern German name for them, "Wagen." The French usually call it "Chariot," but in the south of France, it is given a name similar to ours. They call it the "Casse-rolle," or saucepan.

Each of the stars in the dipper has its own name. Starting from the end of the handle, and ending at the pointers, they are Benetnasch, Mizar (close to which is a fainter star called Alcor), Alioth, Megrez, Phad, Merak and Dubhe, the latter being the pointer nearer the pole.

Dipper Tells Time

In addition to indicating the north, the dipper can also be used for telling time. This is nothing new, for in the second act of the first part of Henry IV, Shakespeare has a carrier in the Inn-yard say "An't be not four by the day I'll be hanged: Charles' Wain is over the new chimney."

Before the days of clocks, when sundials were the principal time pieces, a device called a "nocturnal" was used to tell the time at night, by the position of the pointers. A few years ago, exactly the same device was issued as a novelty, but it is easy to find the time from the pointers without any instrumental aid. One rule for doing it is as follows:

Read the apparent time from the

stars, considering the pole star as the center of the dial, and the pointers as the hour hand. The figure twelve is supposed to be directly above the pole. The indicated time can easily be read to the nearest quarter hour. Now add to this the number of months that have elapsed since January first, to the nearest quarter month. Double this figure. Then subtract the result from $16\frac{1}{4}$, or from $40\frac{1}{4}$, if the result is greater than the former figure. The answer is the time in hours p. m., so if it is greater than 12, subtract 12, and you have the time in hours a. m.

An Example

Let us try an example of this. In an evening this month, the pointers are in the position of 1:00 o'clock. Three and a half months have passed since the beginning of the year, which, added, makes $4\frac{1}{2}$. Double this is 9, which, subtracted from $16\frac{1}{4}$, is $7\frac{1}{4}$, so the time is 7:15 p. m.

During April the moon goes through its phases as follows: It is at first quarter on the third, full on the tenth, at last quarter on the 16th and new on the 24th. Thus, there will be bright moonlight evenings from the beginning of the month to about the thirteenth, and again in the last few days of the month. The moon passes Mars on the sixth, and Jupiter the next day. On the 18th, it passes Saturn which is to be seen in the early morning sky. Mercury will also be seen in the east before sunrise about the 20th, but it will only be visible close to the horizon. Venus is close to the sun this month, and will not be seen at all.

PSYCHOLOGY

Color Blind Found To Have One Advantage

DO NOT FEEL too sorry for the color blind, for their defect has been found to give them one advantage over persons with normal color vision. The color blind have more than average ability to distinguish between different shades of light and dark. On this account, a color-defective engraver is said to be especially prized by a Philadelphia publishing house.

Color blindness, which afflicts between three and four per cent. of males, was found quite handicapping to a group of young medical students who were examined by Drs. Leandro M. Tocantins and Harold W. Jones at Jefferson Medical College, Philadelphia.

Some of the young doctors could not recognize the rash on scarlet fever patients. They all had trouble in distinguishing between differently-colored bacteria under the microscope. However, their better-than-average ability to distinguish between different shades of light and dark should make them particularly well suited to X-ray work.

Science News Letter, April 1, 1933

PALEONTOLOGY

Prehistoric Man Saw Himalayas Grow Higher

CAVE MEN lived in the Himalayas during the Ice Age, and saw the mountains grow loftier around them. They held their own heroically against "one of the worst climatic catastrophes of the earth's history."

Thus states Dr. Hellmut de Terra, of Yale University, who has just returned from a twenty-month's expedition to the "roof of the world," bringing back evidences of human life in the Pleistocene Himalayas, hitherto unsuspected, and also of the existence in those mountains of the mammoth.

Proof that the mountains had continued rising during human and mammoth occupation during ice age times consists in stone implements and fossils of the mammoth in earth layers that had been thrown into folds subsequent to the deposition of these relics.

"I found in the Kashmir Valley the first traces of prehistoric man: some knives, scrapers and other implements," Dr. de Terra reported. "Close to this prehistoric site I discovered the remains of a mammoth, the ancestral elephant

of the Ice Age period, whose former existence in this most elevated highland of India was hitherto completely unknown. Both finds were made in the Pleistocene clay formation of the Kashmir Valley and date back into prehistory approximately forty to sixty thousand years.

"As in Europe, the prehistoric race took refuge from the advancing ice by settling in areas which climatically permitted human existence. Such natural shelter for man during the great Ice Age was in the case of the Himalayas provided by a few broad valleys which temporarily escaped glaciation. Owing to the fact that these valleys were mainly occupied by fresh water lakes, they not only provided shelter, but also food for prehistoric man, who struggled against one of the worst climatic catastrophes in the earth's history."

Science News Letter, April 1, 1933

CHEMISTRY

Antiquity Had Chemists As Well as Alchemists

NOT ALL the ancients who labored mysteriously with beakers and alembics were mere alchemists, either muddle-headed themselves or deliberately out to fool their neighbors. There were real chemists among them, who knew that the "gold" they were making out of base metals was not real.

So Prof. Tenney L. Davis of the Massachusetts Institute of Technology told members of the American Chemical Society. The chemists of ancient Alexandria knew the difference, he said, and so did the mediæval genius Albertus Magnus, the earliest scientist to be canonized as a saint.

Albertus, said Prof. Davis, wrote in his *De Alchimia* that the gold of alchemy is identical with real gold "in every test and hammering"; but he also wrote in another part of the same book that "the gold of alchemy does not gladden the heart of man, nor cure leprosy, and wounds fester which are made by it." This, Prof. Davis believes, indicates that Albertus knew that "the gold of alchemy" was brass.

Apparently independently of the West, the Chinese invented a system of alchemy about the third century B.C. The Chinese alchemists hoped to produce actual immortality by chemical means, and to become "hsien" or supernaturally endowed, benevolent immortals.

Science News Letter, April 1, 1933

IN SCIENCE

ASTRONOMY

New Star Flashes In Heavens

A NEW STAR is in the heavens. Astronomers at the Royal Belgian Observatory, Brussels, have announced to the astronomical world the discovery of a nova, or new star, located in the constellation of Gemini, the twins. This is a little west of directly overhead in the evening sky. The new star, which is probably a sudden brightening of a star that has heretofore been too faint to be seen with telescopes, is still feeble in light compared with the stars seen with the unaided eye these spring evenings. It is eleventh magnitude, visible only through large telescopes. The nova may signal to the earth the collision of two stars. If our sun had a similar experience, it would of course annihilate the earth.

Science News Letter, April 1, 1933

PHYSIOLOGY

Size of Thyroid Gland Varies With Age and Season

THE THYROID gland in your throat, important in the regulation of bodily functions, varies in size according to your age, and also fluctuates in size according to the season of the year.

These observations by Harry von Kolnitz and Dr. Roe E. Remington, of the South Carolina Food Research Commission, were reported before the American Chemical Society.

Messrs. von Kolnitz and Remington examined the thyroids of 150 human bodies in Charleston. They found that up to the age of forty, human thyroids increased in size; after that they declined steadily. Women's thyroids averaged larger than men's, but contained a lower percentage of iodine.

Thyroids varied seasonally, increasing in weight from April to a peak in July and then decreasing to a constant level from October on through the winter. This latter result disagrees with findings of earlier investigators.

Science News Letter, April 1, 1933

WILD FIELDS

CHEMISTRY

New Leather Makes Shoes Self-Polishing

THE DEVELOPMENT of a new leather that needs no applications of dressing and only a little rubbing to keep it polished was announced by the Mellon Institute of Industrial Research.

It is expected to find application in the shoe and other leather industries and it is said to be the outstanding development in the field since Robert H. Foerderer developed vici leather in the 1880's. The research was conducted by C. H. Geister on behalf of Robert H. Foerderer, Inc., of Philadelphia, Pa.

The conventional vici method of treating leather is followed to a certain point, when the skin is impregnated with filling agents in a new manner. This supports and lubricates the fibers, tending to prevent their breaking down under wear and causing the leather to lose shape.

When shoes of the new leather are worn, the heat of the feet gradually and continuously works the impregnating materials to the surface. A slight brushing will then give a good polish.

The new leather can be made in all colors and it is claimed to be practically scuff-proof, soft and pliable yet shape-holding, durable and water-resistant.

Science News Letter, April 1, 1933

ZOOLOGY

America's Antelope Believed to Be Increasing

THE PRONGHORN, slender and beautiful antelope-like animal of the American West, is believed to be on the increase. Thought to be even nearer extinction than the American buffalo or bison was a generation ago, they are shown by a census conducted by the New York Zoological Society to be approximately 68,000 in number in the United States, with 2,400 additional in Canada. A similar census by the U. S. Biological Survey ten years ago indicated less than 27,000 in this country and 1,327 in Canada. Figures for the present Zoological Society census were

supplied by Federal, State and Dominion authorities.

Wyoming leads the list, with 25,000 animals, as estimated by that state's fish and game commission. An unofficial estimate disagrees with this; setting the number considerably lower. Other states show pronghorn populations ranging from as high as 9,000 in Oregon down to a mere baker's dozen in Nebraska.

The average citizen perhaps has the easiest chance to see pronghorn in Yellowstone National Park, on the buffalo range in the Lamar Valley. Confident in their remarkable running speed, they will race automobiles, being able to keep up a speed of 35 miles an hour for really considerable distances.

When white men first came to the Plains, pronghorn were even more numerous than the bison.

Science News Letter, April 1, 1933

CHEMISTRY

Fabrics in Fires Often Produce Poison Gases

WHEN A MAN falls victim to a fire, if he is not burned outright he is frequently said to be "suffocated by the smoke." But in many cases he is killed by something much more deadly than smoke. Many common household things give off some of the most toxic of poisonous gases, Prof. John C. Olsen of Brooklyn Polytechnic Institute told his fellow-chemists at the meeting of the American Chemical Society. Prof. Olsen has as collaborators in his investigations George E. Ferguson and Leopold Scheffan.

"The gases from all types of fires investigated contain toxic constituents in sufficient amount to make breathing the gases dangerous or even fatal in a relatively short period," said Prof. Olsen. "They vary greatly in toxicity. Those most toxic come from substances containing nitrogen or sulphur or both of these elements.

"Textiles such as clothing, draperies, etc., cotton and rayon produce the least toxic gases, while silk and especially woollens give off hydrogen sulphide, hydrocyanic acid, sulphur dioxide and ammonia, as well as carbon monoxide.

"Acid or ill-smelling constituents mixed with the gases from most combustible materials force those breathing the fumes to seek fresh air. This has been the means of saving the lives of a great many people."

Science News Letter, April 1, 1933

AVIATION

Wool Tufts Help Airplane Designers

TUFTS OF WOOL attached to the wings and other exterior surfaces of airplanes are being used to help designers in obtaining the best shapes for the various parts.

The method is described by Prof. B. Melvill Jones, the Francis Mond Professor of Aeronautical Engineering at Cambridge University, and Flight-lieutenant J. A. G. Haslam, in a report of the British Aeronautical Research Committee.

For ascertaining the direction and force of the air currents created during various maneuvers, a large number of tufts are dotted over the wings. The different ways in which they either stream out or blow about irregularly indicates the nature of the air flow.

The wool tufts also facilitate the detection of eddies, which are formed on the body, wings and tail, particularly at the junctions between them, when streamlining is imperfect. In endeavoring to obtain nearly perfect streamlining designers have previously had to rely partly on theory and partly on experimental tests made with models in wind-tunnels.

Science News Letter, April 1, 1933

PHYSIOLOGY

Motion Pictures Show How Ultraviolet Light Kills

MOTION pictures showing how ultraviolet light of certain wavelengths kills cells were shown before the meeting of the American Chemical Society, by Dr. Ellice McDonald, Alexander J. Allen and Rachel Franklin of the University of Pennsylvania.

They used cells from the spleen for their experimental material, and the wavelengths turned on them ranged between 4350 and 2253 Angstrom units. The wavelengths that were fatal to the cells killed in from fifteen to twenty seconds. The living protoplasm of the cells became greatly agitated, bubbles appeared on the membrane and as a rule the cells finally burst.

The killing effect of the shorter ultraviolet light cannot be equalled by fifteen hours of exposure to strong radiation from radium, nor is the lethal effect of ultraviolet light equalled by twelve to twenty-four hours of exposure to high-voltage X-rays.

Science News Letter, April 1, 1933

GEOLOGY

Meteoric Origin of Carolina "Bays" Disputed

COLLISION of the earth with a comet or a great shower of meteorites did not cause the "bays" of the Carolinas, those mysterious ridge-surrounded elliptical depressions in the sandy coastal plain of the South. Such is the opinion of Dr. C. Wythe Cooke of the U. S. Geological Survey.

The question of the possible meteoric origin of these "bays" was raised a short time ago by Prof. F. A. Melton and Prof. William Schriever of the University of Oklahoma. They defended their thesis at the recent meeting of the American Association for the Advancement of Science at Atlantic City, and subsequently in print in the *Journal of Geology*. But like all good scientists they invited discussion and the expression of any doubts or disagreement that might exist.

Against their hypothesis that the depressions were gouged out by the impact of celestial missiles, Dr. Cooke advanced one of his own, that the ridges were raised by constantly-blowing winds from the sea, raising sandy beach

ridges around lagoons or atoll islands. He said, in part:

"I shall mention three obvious objections to the hypothesis that the elliptical ridges shown in the photograph surround scars made by meteorites.

Ridges Too Small

"First, the ridges are too small. A meteorite big enough to leave a scar a mile wide would make a tremendous splash when it hit the earth. The rim around it would look like a mountain in the flat Carolina plain. Even granting that rims of various original sizes might have been eroded away or buried by sediments to such an extent that all now rise only about five feet above the plain, the rims around the big scars ought to be wider than those around the little scars; but this is not the case. If there is any constant difference in size, the smaller 'scars' have wider and more conspicuous rims than the larger. Moreover, where two 'scars' adjoin one another, the combined rim ought to be larger than elsewhere, for it contains

the material splashed out of two craters; but in several such occurrences the rim is completely absent where the two bays meet.

"Second, the scars from a shower of meteorites should be scattered haphazard throughout the region in which they occur; but there is a definite orderly arrangement of many of the elliptical ridges. The largest ellipses lie in rather compact groups within large irregular bays. The smaller ellipses lie end to end, like beads on a string. They have a distinct linear arrangement. Moreover, the ellipses of all sizes point directly towards the seashore.

"Third, a shower of meteorites ought to show no preference between upland and lowland; but all the elliptical bays appear to lie within the lowlands. Whatever may have produced these low elliptical sand ridges, they are certainly not scars of meteorites.

Once Bars and Beaches

"In plan the sand ridges greatly resemble racetracks; and, figuratively speaking, that is what they really are—racetracks beaten into shape by the hooves of the horses of Neptune. I shall attempt to show that the elliptical sand ridges are bars and beaches built up in shallow waterways by waves and currents whose direction was controlled by winds blowing predominantly from the ocean. After the completion of the ridges, most of the water was drained away by lowering of sea level, swampy vegetation took root in the low places, and the region assumed its present aspect."

Science News Letter, April 1, 1933

Scientists who tested starches found that wheat starch produced the stiffest fabric, potato the least stiff, and corn and rice were intermediate.

Government scientists warn tobacco farmers that they may spread mosaic disease by chewing or handling tobacco from the previous year while they work with young plants.

Karl Wilhelm Scheele

investigated the ores of two heavy metals

Molybdenum and Tungsten

He will tell what he found out about them in the next

CLASSIC OF SCIENCE

CHEMISTRY

Powdered Sugar May Run European Automobiles

SUGAR instead of gasoline will soon be propelling some automobiles in Central Europe if a new development made by K. Cuker, Czech chemist, comes into use.

Sugar refiners know all too well that sugar dust is explosive but it remained for Mr. Cuker to proceed from sugar refinery disasters to a plan for practical utilization of the explosive nature of finely powdered sugar in air.

Owing to the high cost of liquid motor fuels in Europe, numerous attempts have been made there to burn cheap powdered fuels in internal combustion engines; but the ash left by such fuels has been a serious obstacle. Sugar, as an ashless solid, is free from this objection and therefore is a promising candidate if its price is sufficiently

low; but it presents difficulties in the matter of sure, dependable explosion when fired in the cylinders of an engine. Mr. Cuker persisted, in spite of this difficulty, and worked out a system of preparing the sugar for use.

His method is to make a composite liquid and solid fuel; alcohol, denatured with naphthalene, is the liquid vehicle, in the proportion of about 3 parts to 1 of sugar. Certainty of detonation is achieved by adding a small amount, less than one per cent. of nitrated sugar, which is more explosive than the sugar dust. Every ingredient of this composite fuel is ashless; and the mixture detonates, when atomized into an engine cylinder and fired, as certainly and as effectively as gasoline.

Science News Letter, April 1, 1933

INVENTION

The Colt Revolver

"A Classic Invention"

"The Principle of Locking and Turning the Cylinder"

Summarizes This Famous Ancestor of Most Modern Guns

IMPROVEMENT IN FIRE-ARMS
—REVOLVING GUN, Samuel Colt, of Hartford, Connecticut. Specification forming part of Letters Patent [no number] dated February 25, 1836. This is an exact reprint of extracts from the original patent.

To all whom it may concern:

BE IT KNOWN that I, SAMUEL COLT, of Hartford, in the county of Hartford and State of Connecticut, have invented a new and useful Improvement in Fire-Arms; and hereby declare that the following, with the accompanying drawings, is a full and exact description of the construction and operation of the said improvements as invented by me. . . .

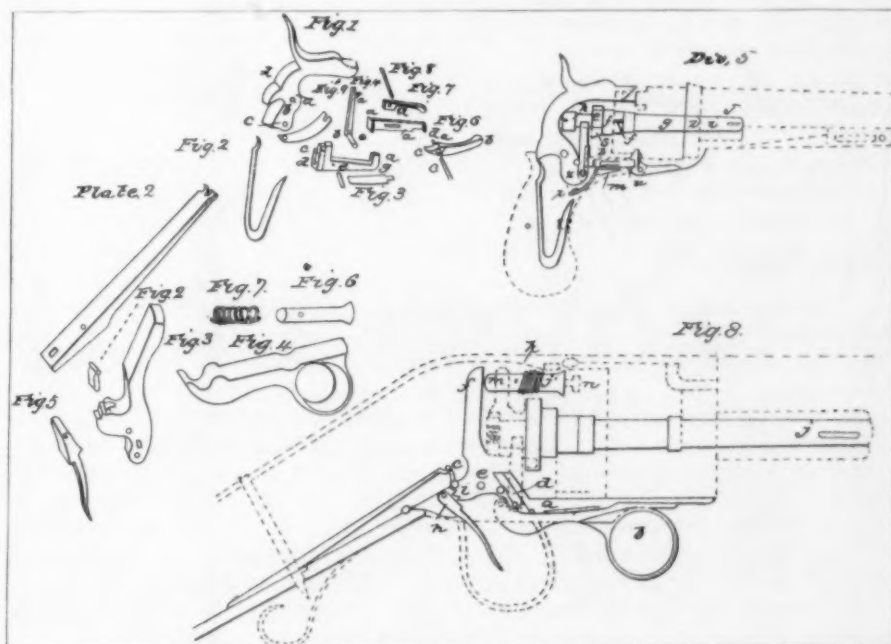
In Division 5 the hammer is hung at the fulcrum *a*. The key which holds the cylinder is hung at the fulcrum *b*. The lifter that works the ratchet has a working connection with the hammer on the left side at *c*. The arm *d* of the lifter works into the teeth of the ratchet on the left. *e* represents the ratchet when connected with the shackle. *ff* is the middle and forward part of the shackle on which the ratchet is placed. *g* is the arbor on which the cylinder revolves. The end *h* is the nut that holds the pin in its place when in the shield. *ii* represent the forward end of the arbor which passes through the plate and the projection on the lower part of the barrel, and by a key at *j* it is secured to the barrel. *k* represents the fulcrum of the trigger. *l* is the spring which forces the connecting rod against the end of the hammer. *m* is the spring which forces the key that holds the cylinder. *O* is the mainspring. By drawing back the hammer the pin *p* operates upon the after end of the key (that locks the cylinder) and rises. Consequently the other end, *r*, is drawn from the cylinder, and the arm *d* of the lifter commences to act on a tooth, *s*, on the left side of the ratchet, which,

being connected to the cylinder by means of the shackle, turns it until the next chamber is brought opposite to the barrel. When the pin *p* is relieved from the key by passing over its upper end, *t*, the pin allows the end *r* of the key to be forced by means of the spring *m* into the succeeding ward of the cylinder. At the same time, by the action of the lower end of the hammer *u* upon the connecting rod at *v*, it produces a forward horizontal motion of the rod, when the end *w* is brought in contact with the upper projection of the trigger and forces it down to a proper position for the finger, when a claw at *x* of the trigger hooks into the connecting rod, which holds the hammer when drawn back or set by means of the end *r* entering the lower catch, *y*, on the hammer. To discharge the pistol, by pulling the trigger the connecting rod is drawn from the catch of the hammer,

when the mainspring forces the hammer forward, the upper end of which strikes the percussion-cap, during which the lifter, by means of lateral motion to the left, falls below a succeeding tooth on the ratchet, when, by means of the lateral motion of the after end *q* of the key which holds the cylinder, the pin *p* of the hammer is permitted to fall below it again. By repetitions of the same motion of the hammer the same effect is produced until each succeeding chamber is discharged. . . .

To Set the Lock

To set the lock, the fulcrum of the lever being at *a*, by drawing down on the end *b* the end *c* operates upon the end *d* of the hammer, whose fulcrum, being at *e*, throws back its end *f*, when the trigger at *g* (whose fulcrum is at *h*) operates upon the catches of the hammer at *i* to hold the lock when set. When the end *f* of the hammer is removed from the adaptor (whose bearings are at *jj*) it is drawn back by means of the coiled spring *k* until its end *l* is drawn back (Turn to Page 204)



THE PARTS OF THE REVOLVER

Colt's patent drawing of the gun and its many jig-saw-like parts. The diagram shows how the mechanism works.

sufficient to allow the cylinder to turn, which is effected as described in the pistol. After the finger is relieved from the lever (when the lock is set) a small spring draws it back to its former place to make room for the end *d* of the hammer, so that its force may not be impaired. By pulling the trigger from the catch of the hammer the mainspring (which is connected to the hammer by the stirrup *o*) forces its end *f* forward against the end *m* of the adopter, the end *l* of which is brought in contact with the percussion-cap placed upon the tube *n*, which discharges the load. To load, it is only requisite to draw the key *j*, which will liberate Section 4. Then by drawing the key that locks the cylinder (which may be effected by drawing back the hammer) the cylinder may be taken from the arbor.

Many Advantages

Among the many advantages in the use of these guns, independent of the number of charges they contain, are, first, the facility in loading them; secondly, the outward security against dampness; thirdly, security of the lock against the smoke of the powder; fourthly, the use of the partitions between the caps, which prevent fire communicating from the exploding cap to the adjoining ones; fifthly, by the hammer's striking the cap at the end of the cylinder no jar is occasioned, deviating from the line of sight; sixthly, the weight and location of the cylinder, which give steadiness to the hand; seventhly, the great rapidity in the succession of discharges, which is effected merely by drawing back the hammer and pulling the trigger.

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From Page 197

age developed, all of the other devices upon which physicists had been working diligently in a half dozen other laboratories.

So striking was the success of the 1,500,000-volt model that Research Corporation funds were obtained under the auspices of the Massachusetts Institute of Technology to build the ten-million-volt machine which is now about to go into the service of physics.

In principle the Van de Graaff generator is simple. From near the surface of the ground to the elevated hollow cylinders there run moving belts. Electricity is picked up upon these belts at

the ground level and it is then conveyed, like water in a bucket pump, to the hollow spheres where it is dumped into them and travels to their surfaces. It is not even necessary to provide a source of low voltage electricity to spray upon the belts as the belts can create and pick up the necessary electricity without aid. One of the hollow cylinders thus has its surface charged positively and the other is charged with negative electricity. How much electricity the hollow cylinders will hold without spilling over, or sparking like artificial lightning, one from the other, depends upon their size and the atmosphere conditions.

A relatively large amount of electricity, a thousand kilowatts, will be generated by the ten million volt machine when it operates. This is as much as

the power plant of a small town generates. Actually the current amounts to 100 milliamperes at a potential of ten million volts.

The generator would light 90,000 ordinary 10 watt, 110 volt incandescent electric lamps, if connected in series, and there would be ten per cent. current margin to spare. If these lamps were set as close together as possible, say eight to the foot, they would string out to about two miles.

The conductivity of the air prevents the generation of voltages much higher than ten million. The experimenters are therefore at work upon a Van de Graaff generator which will be immersed in a gigantic vacuum tank. With this electrical machine they expect to develop fifty million volts.

Science News Letter, April 1, 1933

ASTRONOMY

First Direct Photographs of Sun's Hydrogen Flames Made

SOLAR PROMINENCES, great flames of hydrogen that shoot out from the sun's surface, often to heights of hundreds of thousands of miles, have recently been photographed from the Meudon Observatory, near Paris, without waiting for an eclipse, or using a spectroscope, which has been required hitherto. At a recent meeting of the Academy of Sciences, M. B. Lyot, astronomer at the observatory, described the methods that he had used to accomplish this result, which is considered of great scientific importance.

At the time of a total eclipse of the sun, like that seen in New England last August, the prominences may be seen as brilliant spots of red around the moon's dark disc. Nearly forty years ago Dr. George Ellery Hale, famous American astronomer, and Dr. Henry Deslandres, a Frenchman, independently invented the spectrohelio-graph, which made it possible to photograph them solely by the hydrogen light which they emit. In this way the intensity of the surrounding glare, which is of all colors, was eliminated. Since the prominences are only about five millionths as bright as the sun itself, the glare that surrounds it usually hides them.

A few years ago M. Lyot made some experiments from the summit of the Pic du Midi to record the sun's corona

without waiting for an eclipse. This was successful. Because of the extreme clarity of the atmosphere, the diffuse light around the sun was almost completely absent, and by screening the sun's disc from the plate, it was possible to photograph the prominences directly. It was also possible to see them. Even on poorer days, M. Lyot reported, they could be seen by looking through a red glass filter, which eliminated the diffuse light.

When the experiments were repeated at Meudon, the greater amount of atmospheric haze and dust prevented results being obtained so easily. However, M. Lyot constructed a special filter, consisting of an acid solution of the chemical neodymium nitrate, which was contained in a tube covered at one end with plain glass and at the other with a special red filter. The sun's light was passed through this combination filter, and practically all of the light was removed with the exception of a narrow band of waves in the red, which included all of the red hydrogen light. With this apparatus, revealed M. Lyot, the prominences were photographed successfully. Even on misty days, it was possible to photograph them in an exposure time of one second, with the sun's image 8 centimeters (about 3 1/8 inches) in diameter.

Science News Letter, April 1, 1933

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ZYMOMOLOGY

Beer and Bread Have Been Companions Since Pharaohs

BEEER AND BREAD have been companions on man's tables since the remotest days of antiquity. The Pharaohs of Egypt drank beer with their meals, and the kings of the Babylonian city-states maintained great brewing establishments in their palaces and temples, for the pay of their servants and the allowances of their harem ladies was partly in beer.

They had dozens of varieties of beer in Babylon, each with its own special name. The basic word for beer was "bi"; syllables were added to that to designate particular brands. Some of the names sounded like something gurgling from a jug; when Sargon told his cupbearer to bring a "dark one," this is what he said: "Se-bar-bi-gig-dug-gal!"

Dr. E. Huber of Berlin, who has written a monograph on the making and use of beer in antiquity, believes the Babylonians invented beer and that the Egyptians learned the trick from them. However that may be, they did make it out of the same materials: specially baked loaves of bread, malted grain, barley, emmer, wheat and water.

Babylonian "Sippers"

Drinking through a straw was a necessity in Babylonia, for their beer was served in crocks unfiltered, and you had to stick a drinking-tube through the junk floating on top to get the good beverage beneath. Several thirsty souls would have their tubes into the same vessel, so that the man with the best "pull" got the biggest drink. In Egypt,

however, the clear beer was decanted into serving-bottles and then poured into goblets. One fine Egyptian wall carving, reproduced on the cover of this week's SCIENCE NEWS LETTER, shows a Pharaoh enjoying a glass of beer with his wife. You know it's his wife, because she is wearing a queen's crown.

Egyptians even took beer with them when they died. Many of the tombs of kings and nobles contain models of brewers at work; and an often-repeated item in the lists of things the dead were supposed to have is, "A thousand breads, a thousand beers."

In All Lands and Ages

The knowledge of beer-making spread all over Europe in ancient times. The Romans found the Gauls and Spaniards drinking a "wine" made from barley, and the peoples across the Rhine and around the Baltic were even more valiant tankard-emptiers.

But even the peoples outside the barley-wheat lands have their beers. In southeastern Asia, which is a rice country, rice paste is fermented into a variety of drinks, of which the best known is the Japanese saké.

In the New World, the corn-growing Indians did not fail to discover the beverage possibilities of their grain. A Mexican god had special charge of fermented corn drinks; legend states that on a single visit to earth he brought his mortal friends nine distinct recipes for home brew!

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See Front Cover



Wings for the North

GEESE, ducks, whistling swans, winging swiftly high overhead, scorning the middle latitudes in their migration from their winter feeding grounds to their summer breeding grounds far up in the Arctic, are only giving added testimony to the might of the sun as the visible ruler of earthly life. For they are on their way from lands of winter abundance, thanks to the sun, to lands of even greater abundance in the summer, thanks still to the same great source of light and warmth. The brief stops they make with us, yielding toll of their numbers to a few days of hunting season, are solely for the purposes of feeding and snatching a little rest. Then they are on their way again.

Why should these strong-winged migrants be so eager to reach the Far North, land of Eskimos, polar bears and walruses? Simple enough: they go where it is easiest to make a living, during the strenuous time of rearing their families.

The Far North is anything but a land of desolation during its brief but sun-flooded summer. The famous midnight sun is something more than a wonder-phenomenon for tourists. It is an employer of the green cells in plant leaves that keeps them working in double shifts all summer long, giving them no night of rest at all and forcing the production of available food for birds, in berries and seeds, roots and shoots, on a 24-hour schedule.

By the same token, this great vegetable food supply that is directly available to some birds becomes indirectly available to others through the simply indescribable swarms of insects that rise over the tundras during the intense Arctic summer.

Science News Letter, April 1, 1933

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POLITICAL ECONOMY—AGRICULTURE

**Politics In the Laboratory
Use Scientific Methods**

EDITOR'S NOTE: This editorial, that appeared in Scripps-Howard newspapers throughout the country under the heading "Politics in the Laboratory," is reprinted because of the allusion to the methods of scientific research that it contains. It was written by G. B. Parker, editor-in-chief, Scripps-Howard Newspapers.

ONE OF THE MOST disheartening phases of modern life has been the contrast between the progress of science and the status quo of statesmanship.

From stage coach to airplane is a long step; but from the politics of two centuries ago till now, little if any change; just the same old oratory, the same old viewing with alarm, the same old pointing with pride, the same old appeal to partisanship.

Science works in the laboratory, with no humiliation if an experiment fails. Politics works on the theory of party omniscience on the idea that the president-elect, the governor-elect, the mayor-elect, or the dog-catcher-elect shall propound his program, whatever it may be, and stay with it to the end. The thought of backing up and trying again is not in the code; once admit an error, and all the shafts of the opposition will find you and destroy you.

From such a philosophy are born policies like prohibition, policies that you ride until you drop, though your own investigators say you are wrong and all the realities cry halt.

But a new note has been struck. We read these words in President Roosevelt's message on agriculture: "I tell you frankly that it is a new and untrod path. . . . If a fair administrative trial is made and it does not produce the hoped-for results, I shall be the first to acknowledge it and advise you."

Here we have a President who admits he might be wrong, who is willing to go into the laboratory, try the experiment, find out whether it will work, and recant and try again if he is mistaken.

That is the scientific method. Let us fervently hope that among his many other accomplishments, Franklin D. Roosevelt will continue to inject that method into politics.

Science News Letter, April 1, 1933

Recent excavations at Pompeii show the humble homes and shops in the waterfront section of the city.

CHEMISTRY

**Inferior Goods Camouflaged
By Misuse of Chemistry**

CHEMISTRY, which has contributed so essentially to America's economic progress, is in this depression helping to camouflage inferior quality merchandise.

This danger was mentioned by H. L. Derby, president of the American Cyanamid and Chemical Corporation, in an address before the American Chemical Society.

"One of the notable incidents of the present depression is the demand for low-priced merchandise, quality being one of the lesser considerations—quite the reverse of the prosperity type of demand," said Mr. Derby. "In past generations the distinctions between good and cheap merchandise were readily discernible by the most inexperienced observer. However, modern chemistry has largely eliminated the superficial differences by neatly and attractively covering up the inferior quality."

Chemistry's large contributions to America's industry and independence from foreign sources of essential materials were cited by Mr. Derby, who also predicted the future course of this science applied to industry.

"As necessity has been the mother of invention, it will be the mother of chemical application," he said. "Even today, the separation of non-ferrous metals from their ores is chiefly a chemical process. High-grade iron ore in the Lake Districts is becoming scarce and, in some operations, a crude sort of concentration process is already employed, the concentrate being mixed with high grade ore to maintain the average iron content. Chemical separation and concentration of many other minerals, such as coal, phosphate, earths, etc., is past the experimental stage. Synthetic moulding compounds, developed and produced entirely by the chemical industry, are just a few years old. Their possibilities for future utilitarian use are almost infinite."

"It seems certain that the chemist is destined to bear a heavier burden in the future advancement of housing, even beyond his present contributions of selecting, standardizing and ornamentation. The use of alloys of common and rare metals is in its infancy

and future demands for speed, lightness and durability will expand their use. The chemist, in collaboration with his fellow-scientist, the metallurgist, will be obliged, not only to perfect the structure and application of alloys, but must find a way of making available in commercial quantities what are now the rare alloy materials."

A continuance of tariffs adequate to protect the American chemical industry was urged by Mr. Derby. Cheap foreign labor and depreciated foreign currency threaten the industry, he warned.

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SEISMOLOGY

**St. Patrick's Day Quake
Near Pribilof Islands**

ST. PATRICK'S DAY was marked by the occurrence of an earthquake under the Bering Sea, near the Pribilof Islands, famous fur-seal rookery. The quake began at 10:55.5 a. m., eastern standard time, and its epicenter was located in latitude 55 degrees north, longitude 169 degrees west. This determination was made by seismologists of the U. S. Coast and Geodetic Survey, on the basis of data supplied through Science Service.

Science News Letter, April 1, 1933

**HOW RIVERS CUT GATEWAYS
THROUGH MOUNTAINS**

by

Dr. Douglas Johnson

Professor of Physiography,
Columbia University

This address will be given Friday, April 7, at 12:49 P. M. over stations of the Columbia Broadcasting System. Each week at this time a prominent scientist speaks over the Columbia System under the auspices of Science Service.



• First Glances at New Books

General Science

SCIENCE AND HUMAN LIFE—J. B. S. Haldane—*Harper*, 287 p., \$2.50. The author of this collection of essays, delightfully readable and guaranteed to provide controversy with any reader, is one of the encouraging characters on the British scientific stage. Combining a rare writing ability with unorthodoxy of various sorts, gleefully watching the conventional scientists squirm as his literary darts hit tender flesh, J. B. S. Haldane is F. R. S. and a researcher of acknowledged eminence. He is a protagonist for the application of biology to human life in practical ways, yet he recognizes and cautions us against innumerable false prophets who are advertising their own pet theories in sociology as scientific.

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Archaeology

THE MESOLITHIC AGE IN BRITAIN—J. G. D. Clark—*Cambridge Univ. Press*, 223 p., \$4. Between the types of culture sorted out into the Old Stone Age and the New, this writer makes a distinct place for a rather long period of Mesolithic cultures in Britain. Evidence is taken chiefly from sites in southeast Britain, where there is considerable material showing the stone, bone, and horn industries of that time.

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Geology

A KEY TO MINERAL GROUPS, SPECIES AND VARIETIES—Edward S. Simpson—*Chapman & Hall*, 84 p., \$2.50. This is a dictionary of mineral names giving the chemical composition, crystalline structure, specific gravity and refractive index of all, and more particularly the newer mineral groups, species and varieties. The author, who is mineralogist and analyst to the Government of Western Australia, explains that this index will supplement Dana's System of Mineralogy.

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Mechanical Engineering

DESIGNING FOR ARC WELDING—A. F. Davis—*Lincoln Electric Co.*, 413 p., \$2.50. Arc welding is being applied widely to the machine, ship, construction and other industries. This volume contains the papers of the Second Lincoln Arc Welding Prize Competition, which was instituted to increase the knowledge of the arc welding process

and call attention to the advantages, economies and possibilities that the newer processes of welding hold for industry.

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Physics

HEAT AND ITS WORKINGS—Morton Mott-Smith—*Appleton*, 230 p., \$2. Dr. Mott-Smith the author of "This Mechanical World," a previous volume in the Appleton New World of Science Series, edited by the editor of the *SCIENCE NEWS LETTER*, continues his authoritative but readable account of physics in this volume. If you have been confused about calories or heat energy and the role of fire in our civilization, this is the book you should read. "The gods did well to bind Prometheus to the rocks when he stole fire from heaven, for by this act he enabled men themselves to become like gods and to rule the elements," Dr. Mott-Smith writes in his introduction. "Control fire, and you control everything. The discovery of fire was indeed the greatest achievement of primitive men, the one thing that more than any other lifted him from the level of the beast, and gave him dominion over the earth. Heat is the most powerful and obedient servant. It cooks his food, warms his dwelling, moves his machinery, and performs a myriad of useful services for him."

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Astronomy

ASTRONOMIE ELEMENTAIRE—Frère Robert, F. E. C.—*Frères des Ecoles Chrétiennes*, 397 p., \$2.50. An elementary astronomy written in French to serve the needs of a portion of our neighbor country to the north.

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WORLD ATLAS—Albert & Charles Boni, 352 p., \$1. Using Hammond maps and containing a gazetteer index of the world together with 1933 population figures of the cities and towns in the United States, this volume will serve well as a handy reference atlas.

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Biography

E. W. SCRIPPS—N. D. Cochran—*Harcourt, Brace*, 315 p., \$3. The author of this biography of E. W. was for twenty-three years his constant coworker and confidant. He presents Scripps the editor, the publisher, the creator, the experimenter and the public servant. Much of the narrative is in Scripps' own words taken from letters, disquisitions and autobiographical notes. The name of E. W. Scripps is known throughout the world as that of a great journalist yet the public has had the opportunity of knowing but little of Scripps, the man, nor has the influence of E. W. Scripps upon economic, governmental and cultural life of America been widely appreciated. Not only was E. W. Scripps the founder of the Scripps-Howard Newspapers and the United Press but he fathered Science Service, a hybrid institution part scientific and part journalistic, as well as the Scripps Institution of Oceanography and the Scripps Foundation for Population Research. Those who knew E. W. feel the force of his influence through Cochran's vigorous writing and they will read with interest the epigrammatic quotations from E. W.'s disquisitions and letters which are included in the book.

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Zoology

LOVABLE BEASTS—Harper Cory—Ivor Nicholson and Watson, London, 119 p., \$4. A beautifully gotten up nature book, with animals' life stories in narrative form by a Fellow of the Royal Canadian Geographical Society. The 65 photographic illustrations, all of a very high order of excellence, are inserted as unpaginated plates.

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Chemistry

AN OUTLINE OF FIRST YEAR COLLEGE CHEMISTRY—John R. Lewis—*Barnes & Noble*, 252 p., 75c. Three uses for this outline are suggested: as a teaching aid, as a companion book to standard texts and as a textbook.

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Science News Letter will secure for its subscribers any book or magazine in print, which was published in the United States. Send check or money order to cover regular retail price (\$5 if price is unknown, change to be remitted) and we will pay postage in the U. S. When publications are free, send 10c for handling. Address: Book Dept., Science News Letter, 21st and Constitution Ave., Washington, D.C.